



CSA B44.9:23/ASME A17.9-2023

National Standard of Canada
American National Standard



Elevator buffers

Click to view the full PDF of ASME A17.9-2023



Legal Notice for Harmonized Standard Jointly Developed by ASME and CSA Group

Intellectual property rights and ownership

As between American Society of Mechanical Engineers (“ASME”) and Canadian Standards Association (Operating as “CSA Group”) (collectively “ASME and CSA Group”) and the users of this document (whether it be in printed or electronic form), ASME and CSA Group are the joint owners of all works contained herein that are protected by copyright, all trade-marks (except as otherwise noted to the contrary), and all inventions and trade secrets that may be contained in this document, whether or not such inventions and trade secrets are protected by patents and applications for patents. The unauthorized use, modification, copying, or disclosure of this document may violate laws that protect the intellectual property of ASME and CSA Group and may give rise to a right in ASME and CSA Group to seek legal redress for such use, modification, copying, or disclosure. ASME and CSA Group reserve all intellectual property rights in this document.

Disclaimer and exclusion of liability

This document is provided without any representations, warranties, or conditions of any kind, express or implied, including, without limitation, implied warranties or conditions concerning this document’s fitness for a particular purpose or use, its merchantability, or its non-infringement of any third party’s intellectual property rights. ASME and CSA Group do not warrant the accuracy, completeness, or currency of any of the information published in this document. ASME and CSA Group make no representations or warranties regarding this document’s compliance with any applicable statute, rule, or regulation.

IN NO EVENT SHALL ASME AND CSA GROUP, THEIR RESPECTIVE VOLUNTEERS, MEMBERS, SUBSIDIARIES, OR AFFILIATED COMPANIES, OR THEIR EMPLOYEES, DIRECTORS, OR OFFICERS, BE LIABLE FOR ANY DIRECT, INDIRECT, OR INCIDENTAL DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES, HOWSOEVER CAUSED, INCLUDING BUT NOT LIMITED TO SPECIAL OR CONSEQUENTIAL DAMAGES, LOST REVENUE, BUSINESS INTERRUPTION, LOST OR DAMAGED DATA, OR ANY OTHER COMMERCIAL OR ECONOMIC LOSS, WHETHER BASED IN CONTRACT, TORT (INCLUDING NEGLIGENCE), OR ANY OTHER THEORY OF LIABILITY, ARISING OUT OF OR RESULTING FROM ACCESS TO OR POSSESSION OR USE OF THIS DOCUMENT, EVEN IF ASME OR CSA GROUP HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, INJURY, LOSS, COSTS, OR EXPENSES.

In publishing and making this document available, ASME and CSA Group are not undertaking to render professional or other services for or on behalf of any person or entity or to perform any duty owed by any person or entity to another person or entity. The information in this document is directed to those who have the appropriate degree of experience to use and apply its contents, and ASME and CSA Group accept no responsibility whatsoever arising in any way from any and all use of or reliance on the information contained in this document.

ASME and CSA Group have no power, nor do they undertake, to enforce compliance with the contents of the standards or other documents they jointly publish.

Authorized use of this document

This document is being provided by ASME and CSA Group for informational and non-commercial use only. The user of this document is authorized to do only the following:

If this document is in electronic form:

- load this document onto a computer for the sole purpose of reviewing it;
- search and browse this document; and
- print this document if it is in PDF format.

Limited copies of this document in print or paper form may be distributed only to persons who are authorized by ASME and CSA Group to have such copies, and only if this Legal Notice appears on each such copy.

In addition, users may not and may not permit others to

- alter this document in any way or remove this Legal Notice from the attached standard;
- sell this document without authorization from ASME and CSA Group; or
- make an electronic copy of this document.

If you do not agree with any of the terms and conditions contained in this Legal Notice, you may not load or use this document or make any copies of the contents hereof, and if you do make such copies, you are required to destroy them immediately. Use of this document constitutes your acceptance of the terms and conditions of this Legal Notice.



Standards Update Service

CSA B44.9:23/ASME A17.9-2023 August 2023

Title: *Elevator buffers*

To register for e-mail notification about any updates to this publication

- go to www.csagroup.org/store/
- click on **Product Updates**

The **List ID** that you will need to register for updates to this publication is **2430304**.

If you require assistance, please e-mail techsupport@csagroup.org or call 416-747-2233.

Visit CSA Group's policy on privacy at www.csagroup.org/legal to find out how we protect your personal information.

ASME NORMDOC.COM : Click to view the full PDF of ASME A17.9-2023

Canadian Standards Association (operating as “CSA Group”), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users — including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

More than 10 000 members indicate their support for CSA Group’s standards development by volunteering their time and skills to Committee work.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in fourteen countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard
Toronto, Ontario, M9W 1R3
Canada

A National Standard of Canada is a standard developed by a Standards Council of Canada (SCC) accredited Standards Development Organization, in compliance with requirements and guidance set out by SCC. More information on National Standards of Canada can be found at www.scc.ca.

SCC is a Crown corporation within the portfolio of Innovation, Science and Economic Development (ISED) Canada. With the goal of enhancing Canada’s economic competitiveness and social wellbeing, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts.

Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Standards Council of Canada
600-55 Metcalfe Street
Ottawa, Ontario, K1P 6L5
Canada



Cette Norme Nationale du Canada est disponible en versions française et anglaise.

Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users to judge its suitability for their particular purpose.

®A trademark of the Canadian Standards Association, operating as “CSA Group”

CSA Group

The Canadian Standards Association (operating as "CSA Group"), under whose auspices this National Standard has been produced, was chartered in 1919 and accredited by the Standards Council of Canada to the National Standards system in 1973. It is a not-for-profit, nonstatutory, voluntary membership association engaged in standards development and certification activities.

CSA Group standards reflect a national consensus of producers and users including manufacturers, consumers, retailers, unions and professional organizations, and governmental agencies. The standards are used widely by industry and commerce and often adopted by municipal, provincial, and federal governments in their regulations, particularly in the fields of health, safety, building and construction, and the environment.

More than 10 000 members indicate their support for CSA Group's standards development by volunteering their time and skills to Committee work.

CSA Group offers certification and testing services in support of and as an extension to its standards development activities. To ensure the integrity of its certification process, CSA Group regularly and continually audits and inspects products that bear the CSA Group Mark.

In addition to its head office and laboratory complex in Toronto, CSA Group has regional branch offices in major centres across Canada and inspection and testing agencies in fourteen countries. Since 1919, CSA Group has developed the necessary expertise to meet its corporate mission: CSA Group is an independent service organization whose mission is to provide an open and effective forum for activities facilitating the exchange of goods and services through the use of standards, certification and related services to meet national and international needs.

For further information on CSA Group services, write to
CSA Group
178 Rexdale Boulevard, Toronto, Ontario, M9W 1R3
Canada

American National Standards Institute

The American National Standards Institute (ANSI), Inc. is the nationally recognized coordinator of voluntary standards development in the United States through which voluntary organizations, representing virtually every technical discipline and every facet of trade and commerce, organized labor and consumer interests, establish and improve the some 10 000 national consensus standards currently approved as American National Standards.

ANSI provides that the interests of the public may have appropriate participation and representation in standardization activity, and cooperates with departments and agencies of U.S. Federal, state and local governments in achieving compatibility between government codes and standards and the voluntary standards of industry and commerce.

ANSI represents the interests of the United States in international nontreaty organizations such as the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). The Institute maintains close ties with regional organizations such as the Pacific Area Standards Congress (PASC) and the Pan American Standards Commission (COPANT). As such, ANSI coordinates the activities involved in the U.S. participation in these groups.

ANSI approval of standards is intended to verify that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standards has been achieved. ANSI coordination is intended to assist the voluntary system to ensure that national standards needs are identified and met with a set of standards that are without conflict or unnecessary duplication in their requirements.

Responsibility of approving American standards rests with the
American National Standards Institute, Inc.
25 West 43rd Street, Fourth floor
New York, NY 10036

National Standard of Canada American National Standard

ASME/CSA Standard

CSA B44.9:23/ASME A17.9-2023 Elevator buffers



®A trademark of the Canadian Standards Association
and CSA America Inc., operating as "CSA Group"

*Approved on July 12, 2023 by ANSI
Published in August 2023 by CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard, Toronto, Ontario, Canada M9W 1R3
1-800-463-6727 • 416-747-4044*

Visit the CSA Group Online Store at www.csagroup.org/store/

*The American Society of Mechanical Engineers (ASME)
Two Park Avenue
New York, NY 10016-5990, USA
1-800-843-2763*

Visit the ASME Online Store at www.asme.org

Commitment for Amendments

This Standard is issued jointly by the American Society of Mechanical Engineers (ASME) and the Canadian Standards Association (Operating as “CSA Group”). Amendments to this Standard will be made only after processing according to the Standards writing procedures of both ASME and CSA Group.

Effective Date

This edition of the Standard may be used beginning with the date of issuance printed on this page. The authority having jurisdiction will establish the effective date for its local regulations.

The American Society of Mechanical Engineers (ASME)
Two Park Avenue
New York, NY 10016-5990
USA
1-800-843-2763
Visit the ASME Online Store at
www.asme.org

ISBN 978-0-7918-7627-5
Copyright © 2023 by The American Society of Mechanical Engineers (ASME)

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted. The Committee Pages can be found at <http://cstools.asme.org>.

There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting “Errata” in the “Publication Information” section.

Published in August 2023 by
CSA Group
A not-for-profit private sector organization
178 Rexdale Boulevard
Toronto, Ontario, Canada
M9W 1R3
1-800-463-6727 or 416-747-4044
Visit the CSA Group Online Store at
www.csagroup.org/store/

ISBN 978-1-4883-4513-5
ICS 91.140.90
© 2023 Canadian Standards Association

All rights reserved. No part of this publication may be reproduced in any form whatsoever without the prior permission of the publisher

Contents

CSA Technical Committee on the Elevator Safety Code 3

ASME A17 Standards Committee 8

CSA/ASME Joint Subcommittee on Elevator Buffers 11

Preface 12

1 Scope 15

- 1.1 Inclusions 15
- 1.2 Exclusions 15
- 1.3 Dual measurements 15
- 1.4 Terminology 15

2 Reference publications 15

3 Definitions 15

4 Construction 16

- 4.1 Oil buffer 16
 - 4.1.1 Stroke 16
 - 4.1.2 Retardation 16
 - 4.1.3 Factor of safety for oil-buffer parts 16
 - 4.1.4 Slenderness ratio for members under compression as columns 16
 - 4.1.5 Plunger requirements 16
 - 4.1.6 Means for determining oil level 17
 - 4.1.7 Buffer oil requirements 17
- 4.2 Elastomeric buffers 17
 - 4.2.1 Retardation 17
 - 4.2.2 Return speed 17
 - 4.2.3 Deformation 17
 - 4.2.4 Full compression 17

5 Marking and literature requirements 17

- 5.1 Oil buffer data plate 17
- 5.2 Oil buffer drawings 17
- 5.3 Elastomeric buffer data plate 18
- 5.4 Elastomeric buffer drawings 18

6 Tests 18

- 6.1 Tests for oil buffers 18
 - 6.1.1 General 18
 - 6.1.2 Test sample 18
 - 6.1.3 Testing equipment 19
 - 6.1.4 Installation of the buffer and preparations for tests 19
 - 6.1.5 Test procedure 20
- 6.2 Tests for elastomeric buffers 22

6.2.1	Test sample	22
6.2.2	Testing equipment	22
6.2.3	Installation of the buffer and preparation for tests	23
6.2.4	Test procedure	23
6.2.5	Test result	24

ASMENORMDOC.COM : Click to view the full PDF of ASME A17.9 2023

CSA Technical Committee on the Elevator Safety Code

D. McColl	Otis Canada Inc., Mississauga, Ontario, Canada <i>Category: Producer Interest</i>	<i>Chair</i>
C. S. Cowen	TK Elevator (Canada) Ltd., Toronto, Ontario, Canada <i>Category: Producer Interest</i>	<i>Vice-Chair</i>
C. M. Ayling	PCL Constructors Canada Inc., Mississauga, Ontario, Canada <i>Category: User/General Interest</i>	
G. Bastien	Régie du bâtiment du Québec, Hull, Québec, Canada <i>Category: Regulatory Authority</i>	
L. Bialy	Louis Bialy and Associates LLC, San Rafael, California, USA	<i>Non-voting</i>
S. Bornstein	KONE, Mississauga, Ontario, Canada <i>Category: Producer Interest</i>	
M. Brierley	Coldwater, Ontario, Canada	<i>Non-voting</i>
K. L. Brinkman	National Elevator Industry Inc., Eureka, Illinois, USA	<i>Non-voting</i>
D. Bruce	Alberta Municipal Affairs, Edmonton, Alberta, Canada <i>Category: Regulatory Authority</i>	
K. C. Cheong	MKC Engineering Corp., Vancouver, British Columbia, Canada <i>Category: User/General Interest</i>	
M. D. Do Couto	Sigma Elevating Ltd., Vaughan, Ontario, Canada	<i>Non-voting</i>

K. Duncan	Inspection and Technical Services, Winnipeg, Manitoba, Canada <i>Category: Regulatory Authority</i>	
T. Evans	Underwriters Laboratories Inc., Toronto, Ontario, Canada	<i>Non-voting</i>
P. Fraser	Government of Newfoundland and Labrador/ Service NL, Mount Pearl, Newfoundland and Labrador, Canada <i>Category: Regulatory Authority</i>	
A. Ghazanchaei	Otis Canada Inc., Mississauga, Ontario, Canada	<i>Non-voting</i>
G. W. Gibson	George W. Gibson & Associates Inc., Sedona, Arizona, USA	<i>Non-voting</i>
S. Gurumurthy	KONE, Mississauga, Ontario, Canada	<i>Non-voting</i>
A. S. Hopkirk	Trident Elevator Company Ltd., Scarborough, Ontario, Canada <i>Category: User/General Interest</i>	
R. Isabelle	KJA Consultants Inc., Toronto, Ontario, Canada <i>Category: User/General Interest</i>	
F. Kassem	ThyssenKrupp Elevator Canada, Montréal, Québec, Canada	<i>Non-voting</i>
C. Kelesis	Toronto Transit Commission, Toronto, Ontario, Canada	<i>Non-voting</i>
J. W. Koshak	Elevator Safety Solutions LLC, Collierville, Tennessee, USA	<i>Non-voting</i>
R. Kremer	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada	<i>Non-voting</i>
D. Laguerre	Schindler Elevator Corp., Toronto, Ontario, Canada <i>Category: Producer Interest</i>	

D. Lenardis	Public Service Procurement Canada, Ottawa, Ontario, Canada	<i>Non-voting</i>
E. MacArthur	Otis Canada Inc., Ottawa, Ontario, Canada <i>Category: Producer Interest</i>	
S. E. MacArthur	Department of Community and Cultural Affairs and Labour, Charlottetown, Prince Edward Island, Canada <i>Category: Regulatory Authority</i>	
R. Marsiglio	H. H. Angus & Associates Ltd., Toronto, Ontario, Canada <i>Category: User/General Interest</i>	
P. McClare	Department of Labour and Advanced Education, Dartmouth, Nova Scotia, Canada <i>Category: Regulatory Authority</i>	
E. McClaskey	International Union of Elevator Constructors, Pleasant Hill, California, USA <i>Category: User/General Interest</i>	
K. L. McGettigan	Elevator Industry Work Preservation Fund, Effingham, New Hampshire, USA <i>Category: User/General Interest</i>	
A. McGregor	Rooney, Irving & Associates Ltd., Ottawa, Ontario, Canada	<i>Non-voting</i>
C. McIntyre	Canadian Elevator Industry Educational Program, Pickering, Ontario, Canada <i>Category: User/General Interest</i>	
D. McLellan	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada <i>Category: Regulatory Authority</i>	
M. Mihai	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada	<i>Non-voting</i>
T. Miller	Priestman Neilson & Associates Ltd., Ottawa, Ontario, Canada <i>Category: User/General Interest</i>	

R. Murphy	Garaventa Canada Ltd., Surrey, British Columbia, Canada <i>Category: Producer Interest</i>	
H. Nuri	Toronto Transit Commission, Toronto, Ontario, Canada	<i>Non-voting</i>
S. Palko	Regina, Saskatchewan, Canada	<i>Non-voting</i>
M. Pedram	Modern Elevator Innovations Inc., Burlington, Ontario, Canada <i>Category: Producer Interest</i>	
H. Peelle	The Peelle Company Ltd., Longboat Key, Florida, USA <i>Category: Producer Interest</i>	
B. Potvin	National Research Council — Codes Canada, Ottawa, Ontario, Canada <i>Category: User/General Interest</i>	
A. Rehman	Schindler Elevator Corp., Morristown, New Jersey, USA	<i>Non-voting</i>
A. Reistetter	National Elevator & Escalator Association, Mississauga, Ontario, Canada	<i>Non-voting</i>
S. Reynolds	The Peelle Company Ltd., Brampton, Ontario, Canada	<i>Non-voting</i>
E. Ryba	Public Services and Procurement Canada, Ottawa, Ontario, Canada <i>Category: User/General Interest</i>	
R. Santos	Technical Safety Authority of Saskatchewan (TSASK), Regina, Saskatchewan, Canada <i>Category: Regulatory Authority</i>	
R. Scharfe	Pembroke, Ontario, Canada	<i>Non-voting</i>
P. Sorensen	Technical Safety BC, Vancouver, British Columbia, Canada	<i>Non-voting</i>

K. Steeves	Province of New Brunswick Department of Public Safety, Moncton, New Brunswick, Canada <i>Category: Regulatory Authority</i>	
M. Tevyaw	MHT Codes & Consulting Specialists, Burlington, Ontario, Canada	<i>Non-voting</i>
T. Thomas	Government of the Northwest Territories, Yellowknife, NWT, Canada <i>Category: Regulatory Authority</i>	
E. Towson	Technical Safety BC, West Kelowna, British Columbia, Canada <i>Category: Regulatory Authority</i>	
B. Virk	UT Elevator Inc., Toronto, Ontario, Canada <i>Category: Producer Interest</i>	
J. Virk	Unitech Elevator Company, Pickering, Ontario, Canada	<i>Non-voting</i>
K. Virk	UT Elevator Inc., Toronto, Ontario, Canada	<i>Non-voting</i>
M. Wu	Société de transport de Montréal (STM), Montréal, Québec, Canada <i>Category: User/General Interest</i>	
L. Yang	CSA Group, Toronto, Ontario, Canada	<i>Non-voting</i>
M. Zingarelli	MAD Elevator Inc., Mississauga, Ontario, Canada	<i>Non-voting</i>
G. Lee	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

ASME A17 Standards Committee

H. Peelle	The Peelle Company Ltd., Longboat Key, Florida, USA	<i>Chair</i>
R. Baxter	Baxter Residential Elevators LLC, Allen, Texas, USA	<i>Vice-Chair</i>
M. Tevyaw	MHT Codes & Consulting Specialists, Burlington, Ontario, Canada	<i>Vice-Chair</i>
E. Baker	National Elevator Industry Educational Program, Omaha, Nebraska, USA	
D. Barker	State of California, San Diego, California, USA	
J. Blain	Edgett Williams Consulting Group, New York, New York, USA	
S. Bornstein	KONE, Mississauga, Ontario, Canada	
P. Bothwell	Draka EHC, Oshawa, Ontario, Canada	
D. Boucher	KONE, Allen, Texas, USA	<i>Alternate</i>
K. Brinkman	National Elevator Industry Inc., Metamora, Illinois, USA	
R. C. Burch	VANTAGE/GAL Manufacturing, Nashville, Tennessee, USA	
G. Burdeshaw	American Society of Mechanical Engineers (ASME), New York, New York, USA	
J. Carlson	J Carlson Consulting LLC, East Hanover, New Jersey, USA	<i>Alternate</i>
J. W. Coaker	Coaker & Co. PC, Fairfax Station, Virginia, USA	

J. Filippone	East Brunswick, New Jersey, USA	
M. Flanagan	Schindler Elevator Corp., Morristown, New Jersey, USA	<i>Alternate</i>
R. Gregory	Vertex Corp., Chicago, Illinois, USA	
P. Hampton	TK Elevator, Atlanta, Georgia, USA	
J. D. Henderson	Middleton, Tennessee	<i>Alternate</i>
J. T. Herrity	Department of the Navy, Naval Facilities Command (NAVFAC), Fleming Island, Florida, USA	
B. Horne	Otis Elevator, Farmington, Connecticut, USA	
N. Imbimbo	Prysmian Group, Conzano, Italy	<i>Alternate</i>
D. Kalgren	KONE, Allen, Texas, USA	
J. Koshak	Elevator Safety Solutions LLC, Germantown, Tennessee, USA	
R. Kremer	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada	
D. McColl	Otis Canada Inc., Oakville, Ontario, Canada	
D. McLellan	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, USA	
L. Metzinger	Alimak Group USA Inc., Franklin, Wisconsin, USA	<i>Alternate</i>
D. Morris	State of California, Santa Ana, California, USA	<i>Alternate</i>

A. L. Peck	Hackensack, New Jersey, USA	
D. Prince	Motion Control Engineering, Rancho Cordova, California, USA	
J. Rearick	Rearick & Company Inc., Manlius, New York, USA	
S. Reynolds	The Peelle Company Ltd., Brampton, Ontario, Canada	<i>Alternate</i>
V. Robibero	Robibero Consultancy LLC, Spring, Texas, USA	
P. Rosenberg	Performance Elevator Consulting LLC, Mequon, Wisconsin, USA	<i>Alternate</i>
R. Seymour	Robert L. Seymour & Associates Inc., Frederick, Maryland, USA	
C. Shade	Oregonia, Ohio, USA	<i>Alternate</i>
A. Shelton	KONE, Allen, Texas, USA	<i>Alternate</i>
R. D. Shepherd	Cape May Court House, New Jersey, USA	
W. Snyder	VTE Solution, LLC, Largo, Florida, USA	
J. Stabler	Stabler Associates Inc., St. Louis, Missouri, USA	<i>Alternate</i>
H. M. Vyas	VDA, New York, New York, USA	<i>Alternate</i>
J. Xue	Shanghai Institute of Special Equipment Inspection and Technical Research (SSEI), Shanghai, China	

CSA/ASME Joint Subcommittee on Elevator Buffers

D. Kalgren	KONE, Allen, Texas, USA	<i>Chair</i>
D. S. Boucher	KONE, Rowlett, Texas, USA	
S. Dormann	TÜV SÜD, Frankfurt am Main, Germany	
T. Evans	Underwriters Laboratories Inc., Toronto, Ontario, Canada	
G. W. Gibson	George W. Gibson & Associates Inc., Sedona, Arizona, USA	
T. Gray	IVEC, McDonough, Georgia, USA	
B. Horne	Otis Elevator, Farmington, Connecticut, USA	
R. Kaspersma	KONE, The Hague, The Netherlands	
E. McClaskey	International Union of Elevator Constructors, Pleasant Hill, California, USA	
M. Mihai	Technical Standards and Safety Authority (TSSA), Toronto, Ontario, Canada	
H. Schäfer	New York City Department of Buildings, New York, New York, USA	
L. Yang	CSA Group, Toronto, Ontario, Canada	
G. Lee	CSA Group, Toronto, Ontario, Canada	<i>Project Manager</i>

Preface

This is the first edition of CSA B44.9/ASME A17.9, *Elevator buffers*.

The purpose of this Standard is to provide requirements for elevator buffers primarily for conformity assessment purposes. This Standard arose from the need to have identical Canadian and U.S. requirements for this equipment, thereby enabling manufacturers to have their products approved for use in Canada or the United States.

Users of this Standard are reminded that additional and site-specific requirements may be specified by federal, provincial/territorial, state, municipal, local, or other authority, or by a project owner. This Standard should not be considered a replacement for the requirements contained in any

- a) applicable federal, state, provincial, or territorial statute;
- b) regulation, license, or permit issued pursuant to an applicable statute; or
- c) contract that any owner has with a contractor.

This Standard was prepared by the CSA/ASME Joint Subcommittee on Elevator Buffers, under the jurisdiction of the CSA Technical Committee on the Elevator Safety Code, the CSA Strategic Steering Committee on Mechanical and Industrial Equipment Safety, and the ASME A17 Standards Committee. It is the intent of these committees to maintain a single harmonized Standard by coordinating their procedures for revising and interpreting this Standard. To this end, interpretations and revisions of this Standard will not be issued without the approval of both the CSA Technical Committee on the Elevator Safety Code and the ASME A17 Standards Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group. This Standard has been approved by the American National Standards Institute (ANSI) as an American National Standard.

ASME Notes:

- 1) *This Standard was developed under procedures accredited as meeting the criteria for American National Standards and it is an American National Standard. The standards committee that approved the code or standard was balanced to ensure that individuals from competent and concerned interests had an opportunity to participate. The proposed standard was made available for public review and comment, which provided an opportunity for additional public input from industry, academia, regulatory agencies, and the public at large*
- 2) *ASME does not “approve”, “rate”, or “endorse” any item, construction, proprietary device, or activity. ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor does ASME assume any such liability. Users of a standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.*
- 3) *Participation by federal agency representatives or persons affiliated with industry is not to be interpreted as government or industry endorsement of this Standard.*
- 4) *ASME codes and standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this and other ASME A17 codes and standards may interact with the committee by requesting interpretations, proposing revisions, and attending committee meetings.*

Correspondence should be addressed to:
Secretary, A17 Standards Committee
The American Society of Mechanical Engineers
2 Park Ave.
New York, NY 10016

All correspondence to the Committee must include the individual's name and post office address in case the Committee needs to request further information.

Proposing Revisions

Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the procedures, and in order to conform to developments in the elevator art. Approved revisions will be published periodically. The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible: citing the Section number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation.

Requesting Interpretations

Upon request, the A17 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the A17 Standards Committee at: <http://go.asme.org/InterpretationRequest>

The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his request utilizing the following format:

Subject: Cite the applicable Section number(s) and a concise description.

Edition: Cite the applicable edition and supplement of the Standard for which the interpretation is being requested.

Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. The question shall be phrased, where possible, to permit a specific "yes" or "no" answer. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in this format will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

CSA Notes:

- 1) Use of the singular does not exclude the plural (and vice versa) when the sense allows.
- 2) Although the intended primary application of this Standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the Standard to judge its suitability for their particular purpose.
- 3) This publication was developed by consensus, which is defined by CSA Policy governing standardization — Code of good practice for standardization as "substantial agreement. Consensus implies much more than a simple majority, but not necessarily unanimity". It is consistent with this definition that a member may be included in the Technical Committee list and yet not be in full agreement with all clauses of this Standard.

- 4) To submit a request for interpretation of this Standard, please send the following information to inquiries@csagroup.org and include "Request for interpretation" in the subject line:
- define the problem, making reference to the specific clause, and, where appropriate, include an illustrative sketch;
 - provide an explanation of circumstances surrounding the actual field condition; and
 - where possible, phrase the request in such a way that a specific "yes" or "no" answer will address the issue.

Committee interpretations are processed in accordance with the CSA Directives and guidelines governing standardization and are available on the Current Standards Activities page at standardsactivities.csagroup.org.

- 5) This Standard is subject to review within five years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line:
- Standard designation (number);
 - relevant clause, table, and/or figure number;
 - wording of the proposed change; and
 - rationale for the change.

CSA B44.9:23/ASME A17.9-2023

Elevator buffers

1 Scope

1.1 Inclusions

This Standard covers mechanical requirements of construction, marking, and type testing requirements for oil buffers and elastomeric buffers intended to be installed in passenger and freight elevators in accordance with ASME A17.1/CSA B44.

1.2 Exclusions

This Standard does not cover spring buffers or electrical components as part of the buffer assemblies.

1.3 Dual measurements

The values given in SI units are the units of record for the purposes of this Standard. The values given in parentheses are for information and comparison only.

1.4 Terminology

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the Standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto. Where “latest edition” is used, it shall mean the most recent edition in publication on the date this document is published.

ASME (American Society of Mechanical Engineers)/CSA Group

ASME A17.1/CSA B44 – latest edition

Safety code for elevators and escalators

3 Definitions

The following definitions shall apply in this Standard:

Buffer — a device designed to stop a descending car or counterweight beyond its normal limit of travel by storing or by absorbing and dissipating the kinetic energy of the car or counterweight.

Elastomeric buffer — an energy-accumulation-type buffer with non-linear characteristics (such as a polyurethane buffer) using resilient materials to cushion the impact force of the descending car or counterweight.

Oil buffer — a buffer using oil as a medium that absorbs and dissipates the kinetic energy of the descending car or counterweight.

Gas spring-return oil buffer — an oil buffer using the pressure of a compressed gas to return the buffer plunger or piston to its fully extended position.

Mechanical spring-return oil buffer — an oil buffer using the force of the compressed mechanical spring or springs to return the buffer plunger or piston to its fully extended position.

Oil buffer stroke — the oil-displacing movement of the buffer plunger or piston, excluding the travel of the buffer plunger accelerating device.

4 Construction

4.1 Oil buffer

4.1.1 Stroke

The minimum stroke of oil buffers shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.1 and Table 2.22.4.1.

4.1.2 Retardation

Oil buffers shall develop an average retardation in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.2.

4.1.3 Factor of safety for oil-buffer parts

The factor of safety of parts of oil buffers shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.3.

4.1.4 Slenderness ratio for members under compression as columns

The slenderness ratio (L/R) for members of oil buffers under compression as columns shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.4.

4.1.5 Plunger requirements

4.1.5.1 Plunger return requirements

Oil buffers shall be designed such that the plunger returns to the extended position in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.5.1.

4.1.5.2 Plunger lateral movement requirements

The clearance between the plunger and the cylinder in spring-return-type or gravity-return-type oil buffers shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.5.2.

4.1.6 Means for determining oil level

Oil buffers shall be provided with means for determining that the oil level is within the maximum and minimum allowable limits in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.6.

4.1.7 Buffer oil requirements

Oils used in oil buffers shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.4.9.

4.2 Elastomeric buffers

4.2.1 Retardation

Buffers retardation limitations shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.5.1.

4.2.2 Return speed

Upon activation (compression) of the buffer, the return speed of the car or counterweight shall be in accordance with ASME A17.1/CSA B44 Requirement 2.22.5.2.

4.2.3 Deformation

There shall be no permanent deformation of the buffer after actuation in accordance with ASME A17.1/CSA B44 Requirement 2.22.5.3.

4.2.4 Full compression

For elastomeric buffers, “full compression” shall have the meaning described in ASME A17.1/CSA B44 Requirement 2.22.5.4.

5 Marking and literature requirements

5.1 Oil buffer data plate

Oil buffers shall have a permanently attached data plate that complies with ASME A17.1/CSA B44 Requirement 8.13.1 and is marked by the manufacturer including

- a) the maximum and minimum loads and the maximum striking speeds for which the buffer has been rated for use;
- b) the permissible range in viscosity of the buffer oil to be used, stated in Saybolt Universal Seconds at 38 °C (100 °F);
- c) the viscosity index number of the oil to be used;
- d) the pour point in degrees Celsius (Fahrenheit) of the oil to be used;
- e) the stroke of the buffer in millimetres (inches);
- f) the composition of the gas, if used;
- g) the name, trademark, or file number by which the organization that manufactured the product can be identified;
- h) indication of certification, which shall include CSA B44.9/ASME A17.9;
- i) the wording “this buffer is evaluated for mechanical performance only”; and
- j) the manufacturer’s designation of type or model assigned to the buffer.

5.2 Oil buffer drawings

Oil buffers shall be provided with separate drawings for the following:

- a) the exact construction of the buffer;

- b) all dimensions of each part;
- c) all pertinent information concerning materials, clearances, and tolerances;
- d) installation instructions for oil buffers when required in accordance with Clause [6.1.4](#); and
- e) data plate with required markings in accordance with Clause [5.1](#).

5.3 Elastomeric buffer data plate

Elastomeric buffers shall be provided with a marking plate that complies with ASME A17.1/CSA B44 Requirement 8.13.3. The buffer marking plate shall include the following data provided in a legible and permanent manner:

- a) the maximum and minimum loads and the maximum striking speeds for which the buffer has been rated for use in conformance with ASME A17.1/CSA B44 Requirement 2.22;
- b) the name, trademark, or file number by which the organization that manufactured the product can be identified;
- c) specific conditions of use (where applicable) for elastomeric buffers (see ASME A17.1/CSA B44 Requirement 2.22.1.1.5);
- d) the maximum stroke (compression) of the buffer;
- e) indication of certification, which shall include CSA B44.9/ASME A17.9; and
- f) the manufacturer's designation of type or model assigned to the buffer.

5.4 Elastomeric buffer drawings

Elastomeric buffers shall be provided with separate drawings for the following:

- a) the exact construction of the buffer;
- b) all dimensions of each part;
- c) all pertinent information concerning materials, clearances, and tolerances; and
- d) all conditions of use as specified by the elastomeric buffers manufacturer. Such conditions include, but are not limited to, temperature, humidity, or other environmental and life-cycle conditions that might affect buffer performance.

6 Tests

6.1 Tests for oil buffers

6.1.1 General

A type test on an oil buffer shall be acceptable for similarly designed buffers, provided the longest stroke of the type is subjected to the type test and the load range of the buffer is within the maximum and minimum range for the oil portings of the given buffer.

6.1.2 Test sample

Tests shall be made on a buffer of each type or design to be installed. The buffer test shall be on a production model or a buffer identical to the model to be produced. Each buffer shall conform to the documents submitted and have the following oil portings:

- a) the porting having the range of the maximum loads for which the buffer is designed; and
- b) the porting having the range of the minimum loads for which the buffer is designed.